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# Metastatic Spinal Cord Compression as Initial Presentation of Follicular Thyroid Carcinoma

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Follicular thyroid carcinoma, initially presenting as spinal cord compression due to metastatic lesions, is a less reported event. We present two cases of well-differentiated thyroid carcinoma that led to spinal cord compression. A thorough search of the literature revealed only five similar cases. We summarize the clinical characteristics of these cases, the therapeutic measures used, their outcome, and the prognosis.

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KEY WORDS: cord compression; initial presentation; metastatic; thyroid carcinoma

## INTRODUCTION

Follicular thyroid carcinoma (FTC), classified as a well-differentiated carcinoma, constitutes about 15–30% of all malignant tumors of the thyroid gland [1]. This type of carcinoma usually has a slow growth rate and a good prognosis while localized to the gland. FTC mainly presents as a local nodule. Extension occurs by invasion to the surrounding structures. Distant metastases are present in 10–50% of newly diagnosed patients [2]. Spinal cord compression (SCC) as a complication of thyroid carcinoma is rare, occurring mainly late in the course of the disease. This might result from a local extension of the primary tumor to the cervical spine [3,4] or by hematogenous spread to the spinal column [5–7]. Review of the literature revealed only five cases in which patients presented with spinal cord compression as the initial manifestation of thyroid carcinoma [3,5–7].

This article presents two cases of FTC that manifested as SCC at presentation of the disease and a review of the literature for other cases of SCC due to thyroid carcinoma, along with the principles of management.

## CASE 1

A 65-year-old woman presented in March 1994 to the Department of Neurosurgery at Rambam Medical Center with gradually increasing neck pain, hyperesthesias and paresthesias of the right hand, and a hard nodule on her left thyroid lobe. Cervical spine computed tomography (CT) scan and magnetic resonance imaging (MRI) demonstrated a space-occupying lesion involving the C2 vertebra with cord compression (Fig. 1). She underwent a laminectomy and tumor excision. Pain and neurologic symptoms promptly disappeared. Histologic examination demonstrated metastatic well-differentiated FTC (Fig. 2).

A full workup was normal except for the hard nodule in the left lobe of the thyroid gland, which exhibited increased radioactive I-131 uptake (2 hr, 4%; 24 hr, 20%). The patient then underwent a left total thyroidectomy and a right near-total thyroidectomy. Histology

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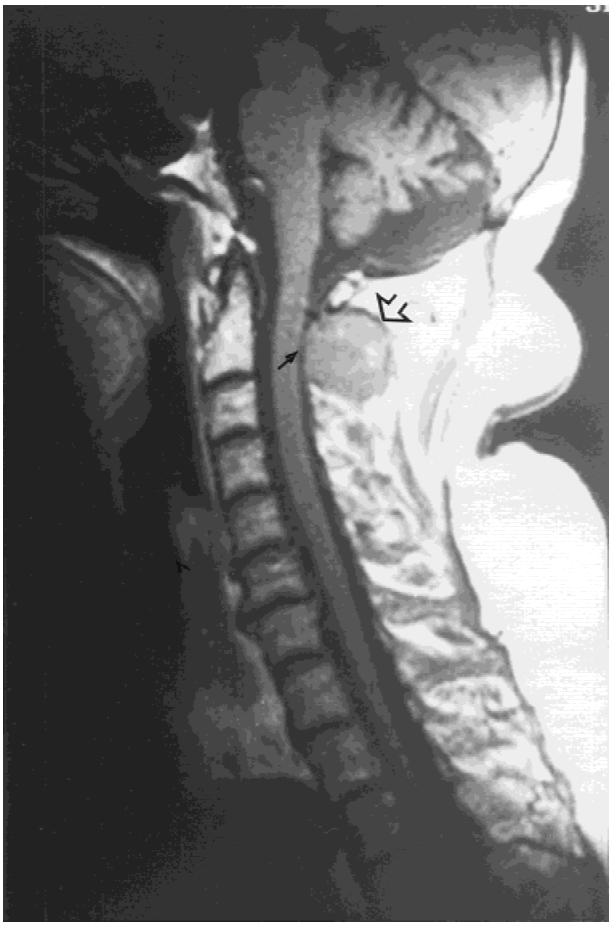

Fig. 1. $T_1$-weighted sagittal MRI image of the craniocervical junction. Round soft tissue mass (open arrow) at the level of C2 lamina, causing pressure on the posterior aspect of the cervical spinal cord (small arrow).

showed well-differentiated FTC resembling the metastatic findings.

The radioactive iodine uptake decreased postoperatively to 3% (2 hr) and 12% (24 hr) solely in the neck region. After a 100-mCi ablative dose of radioactive iodine, the uptake decreased to 0.5% in the anterior neck region, with no evidence of metastatic spread.

Follow-up evaluation at 28 months after completion of treatment showed a patient who is well with no clinical or radiologic evidence of disease. She is well balanced, receiving 1 tablet of Eltroxin daily.

## CASE 2

A 43-year-old woman presented in March 1995 with acute onset of paraparesis, bowel and bladder incontinence, and a sensory deficit at the D1 level. CT scan demonstrated destruction of the first thoracic vertebra by a soft tissue mass extending into the spinal canal, causing cord compression. The metastatic workup was negative otherwise. Surgical intervention was rejected by the neurosurgeons. Fine-needle aspiration of the mass revealed carcinoma cells of unknown origin.

The patient underwent prompt treatment with steroids and irradiation to the areas of C6/T3 (total dose: 30 Gy; daily fractions: 3 Gy). On completion of treatment, all neurologic symptoms disappeared, and the patient became fully ambulatory.

Four months later, a cervical mass was palpated. CT scan demonstrated this finding, as well as enlarged mediastinal lymph nodes. No abnormalities were noted in the thyroid gland. Excisional biopsy of the cervical mass revealed a lymph node infiltrated with well-differentiated FTC, which stained positively to thyreoglobulin (Fig. 3). Histological revision and comparison with the cytological specimen established the thyroidal origin of the initial sample.

The patient underwent subtotal thyroidectomy. Foci of FTC were found in the resected gland. She was referred for total body scan and treatment with radioactive iodine, but fled and could not be traced. Three months later, she returned with full paraplegia, which had developed 2 months earlier. She was treated with Eltroxin but died 5 months later, most probably due to metastatic disease. Permission for autopsy was not granted.

## DISCUSSION

Well-differentiated thyroid carcinoma, in either the papillary or follicular form, usually has a good prognosis, even when metastatic, if adequately treated. Although infrequently metastatic to the spinal epidural space, it usually does so as a late event of a long-standing disease.

Epidural spinal cord compression as initial manifestation of newly diagnosed thyroid carcinoma is a rare event. Barron et al. [8] reviewed 127 necropsy cases of (SCC) due to metastatic malignancies; only three were due to thyroid carcinoma. These investigators found further that only 6% of thyroid cancers eventually produced spinal cord metastatic lesions. Fornasier and Horne [9] reviewed 374 autopsies of malignancies, of which 140 specimens had metastatic spread to the vertebrae, and only one thyroid carcinoma was found.

Only a few cases of SCC presenting as the initial manifestation of newly diagnosed thyroid cancer are reported in the literature. Table I summarizes these cases; two were of the follicular type, one was papillary, and two were of the mixed papillary-follicular pattern. Some of the patients reported in the literature as treated by the surgical approach and/or external irradiation achieved relief of symptoms. However, thyroidectomy, radioactive iodine, and suppression of thyroid-stimulating hormone (TSH) resulted in long-term survival for most patients.

In the two cases reported in this paper, significant improvement was observed. The first patient is free of disease 22 months after completion of treatment. The second patient responded well to radiation therapy and

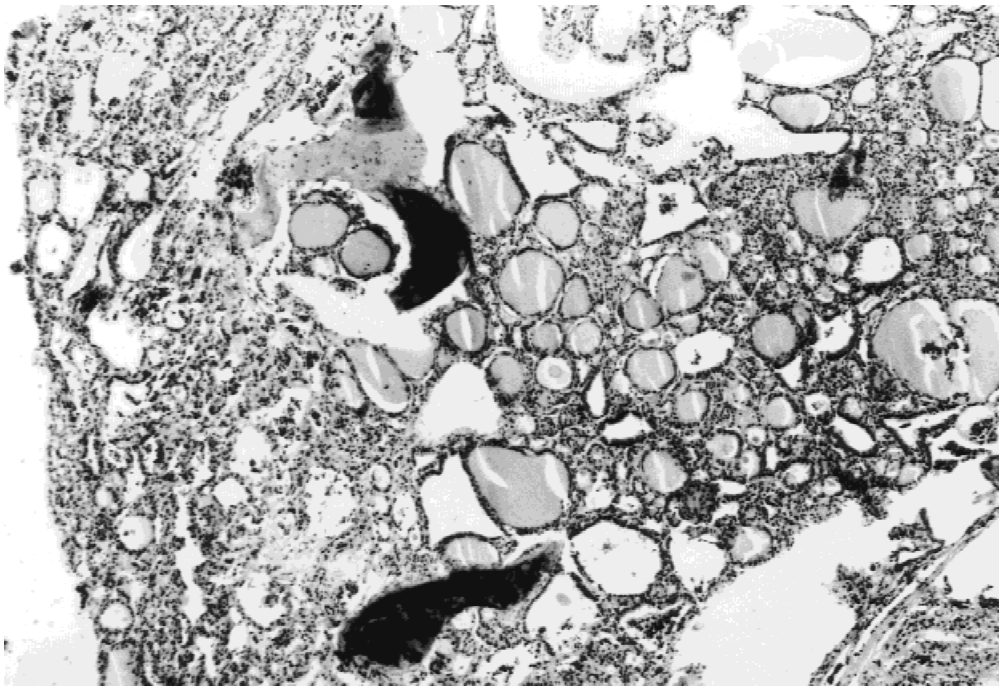

Fig. 2. Well-differentiated follicular thyroid carcinoma infiltrating bone (dense black areas are remnants of bone spicules) (H&E stain, ×70).

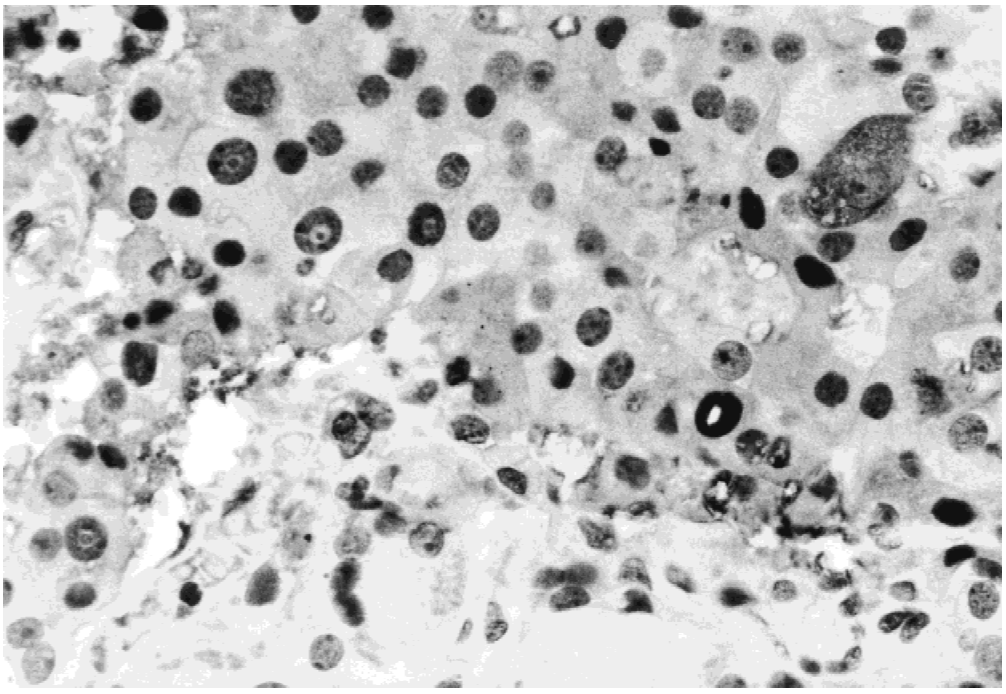

Fig. 3. Solid follicular epithelium with atypical nuclei in an excised lymph node which resembles a metastatic foci. The cells are positively stained to thyreoglobulin antibodies (H&E stain, ×450).

could have benefited from radioactive iodine therapy. Even so, she survived for 12 months after SCC had developed. The recurrence of SCC was probably due to TSH stimulation after thyroidectomy [6,10].

In conclusion, although rare, thyroid carcinoma should be considered in the differential diagnosis of every newly diagnosed case of SCC. This disease responds well to the treatment noted above and sometimes enables long-term survival. SCC constitutes an emergency situation calling for prompt diagnosis and treatment. This is especially the

**TABLE I. Metastatic Thyroid Carcinoma Presenting Primarily With Spinal Cord Compression**

| Ref./Year | Age | Sex | Histology | Spread | Level | Treatment | Outcome | Survival[a] |
|---|---|---|---|---|---|---|---|---|
| Ginsberg et al. (1987) [3] | 76 | M | Papillary | Direct extension | C5–C7 | XRT to lesion | DOD | 1 wk |
| Brodner et al. (1975) [5] | 57 | M | FTC | Metastases | T5–T6 | Laminectomy, excision, thyroidectomy + 100 mCi I-131 | NED, ambulatory | 1 yr |
| Brodner et al. (1975) [5] | 56 | M | FTC | Metastases | L2 + C6 | Thyroidectomy, 148 mCi I-131 | Ambulatory, no recurrence, died of leukemia | 17 yr |
| Shortliffe and Crapo (1982) [6] | 62 | M | Papillary-follicular | Metastases | T2–T3 | I-131 ablation, XRT (dose unknown) | 8 yr NED, then withdrawal T → SCC → death | 8 yr |
| Goldstein et al. (1988) [7] | 58 | M | Follicular-papillary | Metastases | T10 | Laminectomy, excision, thyroidectomy 196 mCi I-131 | NED | 27 mo+ |
| Present case | 65 | F | FTC | Metastases | C2 | Resection, thyroidectomy I-131 ablation | NED | 28 mo |
| Present case | 43 | F | FTC | Metastases | T1 | XRT to metastases, thyroidectomy | DOD | 10.5 mo |

[a]Since end of treatment.
FTC, follicular thyroid carcinoma; NED, no evidence of disease; XRT, radiation therapy; DOD, dead of disease.

case when a treatable situation, such as thyroid carcinoma, is involved, because of its favorable prognosis.

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